

WHAT IS CLAIMED

1. A method of providing a regulated DC voltage comprising the steps of:

(a) providing a DC voltage converter, which is operative to produce a regulated output voltage; and

(b) controlling the operation of said DC voltage converter in accordance with a piecewise linear output voltage vs. output current load line characteristic.

2. The method according to claim 1, wherein said piecewise linear output voltage vs. output current load line characteristic produces a constant voltage for load current values less than or equal to a leakage current value, and produces a linearly decreasing voltage from said constant voltage to a full load voltage for load current values greater than said leakage current value.

3. The method according to claim 1, wherein said piecewise linear output voltage vs. output current load line characteristic produces a constant voltage for a no load current value, and produces a linearly decreasing voltage from said constant voltage to a full load voltage for load current values greater than said no load current value.

4. For use with a DC converter that is operative to supply a regulated DC output voltage to a load, and having an output voltage vs. output current load line boundary specification comprised of an upper load line

characteristic and a lower load line characteristic, a method of optimizing the operation of said DC converter in the presence of a no load leakage current, comprising the steps of:

- (a) causing said DC converter to produce a constant output voltage, corresponding to the voltage V_{LEAK} produced by said upper load line characteristic at said no load leakage current for load current values less than or equal to said leakage current; and
- (b) causing said DC converter to produce a linearly decreasing voltage from said constant voltage V_{LEAK} to a full load voltage $V_{FULL\ LOAD}$, for load current values greater than said leakage current value.

5. The method according to claim 4, wherein step (a) comprises sampling the output current of said DC converter during a time when no current is being drawn by said load, and storing a parameter representative of leakage current in accordance with the sampled value of said output current, and generating said constant voltage V_{LEAK} representative of said parameter and thereby associated with said no load leakage current, in accordance with said stored parameter.

6. An apparatus for providing a regulated DC voltage comprising:

a DC voltage converter, which is operative to produce a regulated output voltage; and

a control circuit which is operative to control the operation of said DC voltage converter in accordance with a piecewise linear output voltage vs. output current load line characteristic.

7. The apparatus according to claim 6, wherein said piecewise linear output voltage vs. output current load line characteristic employed by said control circuit produces a constant voltage for load current values less than or equal to a leakage current value, and produces a linearly decreasing voltage from said constant voltage to a full load voltage for load current values greater than said leakage current value.

8. The apparatus according to claim 6, wherein said piecewise linear output voltage vs. output current load line characteristic employed by said control circuit produces a constant voltage for a no load current value, and produces a linearly decreasing voltage from said constant voltage to a full load voltage for load current values greater than said no load current value.

9. The apparatus according to claim 6, wherein said DC converter has an output voltage vs. output current load line boundary specification comprised of an upper load line characteristic and a lower load line characteristic, and wherein said control circuit is operative to cause said DC converter to produce a

constant output voltage, corresponding to the voltage V_{LEAK} produced by said upper load line characteristic at said no load leakage current for load current values less than or equal to said leakage current, and to cause said DC converter to produce a linearly decreasing voltage from said constant voltage V_{LEAK} to a full load voltage $V_{FULL\ LOAD}$, for load current values greater than said leakage current value.

10. The apparatus according to claim 9, wherein said control circuit is operative to sample the output current of said DC converter during a time when no current is being drawn by said load, and to store a parameter representative of leakage current in accordance with the sampled value of said output current, and to cause said DC converter to generate said constant voltage V_{LEAK} representative of said parameter and thereby associated with said no load leakage current, in accordance with said stored parameter.

11. The apparatus according to claim 10, wherein said control circuit includes a piecewise linear transform unit that produces an output voltage that is a function of said output current in accordance with the piecewise linear transfer function, and in accordance with said sampled and stored parameter representative of leakage current.

12. The apparatus according to claim 11, wherein said DC converter includes an error amplifier having a first input coupled to receive a voltage corresponding to said constant voltage and a second input coupled to receive a sum of the output of said piecewise linear transform unit and said output voltage.